The BRIF: *Success Factors and Crucial Considerations for Ensuring Impact*

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Predicting Success Factors -2010

In May 2010, I was asked to submit my thoughts for a column for the Journal of Biopreservation and Biobanking

Question: ***"What do you see as the biggest challenges and opportunities for Biorepositories in the next 3 - 5 years?"***

“For Biobanks, in the near and long term the biggest challenges and opportunities are in many ways one and the same. Both involve the field’s ability not only to continue to dramatically advance, but to harness its full potential via innovation to ensure actualization of impact.”

“The ability for Biobanks to embrace the changing perspective of viewing the biospecimen as a potential work product and provide focus on the life cycle and related process chain and related pipeline planning will be hugely beneficial.”

"**Towards this pathway a few key things will be incredibly important in fostering success: voluntary adaptation *related to necessary cultural changes*** to further cement and centralize appropriate infrastructure either in instituting center of excellence/biological resource center, core facility and/or integrated Biobank network models (in conjunction with tools to aide inter-operability, **formal induction and evolution towards best in tandem with integration of evidence based practice preparation) and Biobusiness activities** (i.e. cost recovery implementation and ***fit for purpose resource organization and resource evaluation***)."

"Post implementation, these key steps will then contribute to foster viability as well as long term sustainability while providing equitable return on investment.

The collaborative theory will then be put to the test as Biobanks transition from their current pre-competitive to the future competitive yet potentially collaborative environment. **It will therefore be essential to demonstrate the "value add" of utilizing network tools, strategic alliances and private-public partnerships** through proof of concepts pilots that offer shared equity and methodologies to categorize and aggregate sample collections, enhance overall quality of biospecimens and associated data and ***expedite collaboration aimed at discoveries which will ensure real time practice of molecular and personalized medicine such as those related to biomarker validation."***

"**It will also be crucially important to disseminate experiential lessons learned and scientific data amongst scientific and professional trans-boundary disciplines to create a fully operational evidence based environment**. This ability to achieve a trans-boundary educational, yet functional environment will succeed in reducing lags, roadblocks and related impediments that currently exist and may naturally occur along this pathway. In accordance with evolving biospecimen science***, an additional challenge will be quantifying current "catch phrases" i.e. specimen integrity and benchmark specimens and quality marker reference ranges.*** Ideally these should then all be implemented back into the process chain and biospecimen lifecycle management process...

All the while, this management process should be protected by solid vocal public and private stakeholder support secured by prospective integration of appropriate policy and governance structures, which I believe will be the biggest challenge and opportunity of all."

Talk Overview

- Initial Areas of Impact
- Potential Applications
- Key Points of Integration
- Key Attributes and Success Factors
- Crucial Considerations for Design, Implementation & Evaluation
- Example of One Approach to Sample Indices
- BREF Overview
- Recommendations for BRIF

Bioresource *Areas of Impact* include but are not limited to:

Biospecimens, Expertise and Related Data all contribute to:

- *Improvements* in Clinical Care: from Prevention to Cure, QOL
- *Advancements* in
  - Clinical, Community & Biomedical Research
  - Drug Discovery & Development
  - Laboratory and Life Science
- *Development of* Medical, Scientific & Technological Innovations
  - Instrumentation & Infrastructure
  - Biospecimen Science & EBBP
  - Biotechniques
- Education & Training
- Bioeconomic Health and Financial Growth of Organizations

BRIF: Potential Applications

Primary Benefits Include Capability to:

- Stratify/Triage Bioresource via quality designation
  - Facilitate educated decisions about which resources to fund, collaborate with, invest, partner…
  - Assist Objectivity in Biospecimen Prioritization, Utilization and Aggregation
    - What do we really need to collect
    - What collections are "utilization worthy"
    - Which collections are most relative to aggregate with, match sample sets (quality "apples to apples")
- Annotate Progress – Future Outcomes
- Ensure/Protect/Document Return on Investment by tracking of related products, outcomes and impact.- bioresource and the field as a whole.

Secondary Benefits Include:

- Alleviate biobanking and related research outcome quality disparities
- Address Economic Issues- Justify real costs of biocollections to create economies of scale

Key Points of Integration

- Protocols, Study and Project design
  - Quality driven (BRIF focused) protocols
  - Methodology and Reporting Standards
- Bioresource Annual Evaluation
  - End User Utilization Survey
  - Stakeholder reports
  - ROI indicator
- Bioresource Planning
  - Biospecimen Prioritization and Statistical Design Tool
  - Grants/revenue and business planning
  - R&D planning opportunities
  - Organizational Road mapping

Key Attributes & Success Factors

- Relevance- degree and length
- Measurability & Reproducibility
- Statistical Significance & Validity
- Generalizeability & Interoperability
- Adoptability & Feasibility
- Sustainability & Adaptability
- Transformative power & Innovative ability

Crucial Considerations for BRIF: *Design, Implementation and Evaluation (1)*

- Quantitative and Qualitative?
  - Would measurements have be subjective first than objective later, than refined over time a the BRIF evolves? Do we measure + & - outcomes?
- Range of Scope : Foci, Degree/Length of Effect/Outcome, End users, Discipline and Application
  - Customized per discipline, inter-disciplinary BRIF points of interest
- Categories and Levels of Indices: Band Width of Related CDE's & Annotation
- Design Scale (Likert-like?), Weight, Scoring and Evaluatory Algorithms
- Considerations relevant to interpreting for Bias and Confounding Variability
- Targeted but Broad enough to glean relevance as to IMPACT
  - Baseline standard that meets all Bioresources but does not limit initial level of quality measurement/practice
  - One that will evolve as standards/practices/infrastructures evolve- BRIF-Bioresource POC (Proof of Concept) and then evolve
    - BP, fit for purpose, EBBP, ….

Crucial Considerations for BRIF: *Design, Implementation & Evaluation (2)*

- Time points for implementation and evaluation, evolution: Baseline, yearly; q2 years
- Method of Implementation- Manual,Automated?
- Logistics, procedures, policy and strategy as for:
  - Integration into daily Bioresource operations
  - Harmonization with adjunct workfows/processes
  - Quality BRIF Reporting from Adjunct Bioresources
- Education and Training Requirements
- Methodology Related Documentation
  - - E.g. Do we link with reporting measures?

Breaking down the BRIF

- By Type of Bioresource By:
  - Model
    - Clinical, Disease, Population, Bench, Sample Management
  - Population
    - Human (Adult/Ped/Post mortem), Animal, Plant, Environmental
  - Research and Clinical Foci (Diabetes, Cancer, HIV, Rare dz)
  - Type of biospecimen(s); derivative(s);product(s)
    - Blood/tissue/other; cDNA, RNA; TMA, assay, other…
  - Level of Infrastructure
    - Biobank, core bioresource, BRC, BRC/COE, Network
  - Applicable Standards
    - BP, level of GMP, regulations, policies

BRIF: Initial Categories of Evaluation

- Bioresource Specific Impact Factors could include:
  - Quality Measurement/Scoring of:
    - Samples/Collections/Data
    - Analysis and Research Results
    - Derivatives and Work Product
  - Associated Tools, Technologies, Advancements
  - Associated Outcomes: Clinical, Research, Other…
  - Resulting Financial Health Indicators and BREF Data

BRIF: Quality Factors

- Biospecimen Quality Scoring of
  - Direct measure per specimen, per collection
    - Morphological, molecular analysis, quality correlates i.e. RIN to RIN
  - MDS Data Annotation
  - Quality of Work Product
    - E.g. TMA, Blood

    ?- What are the quality factors?

Initial Steps to Baseline BRIF

1. Define and List what BRIF related data points you want to measure, track and compare
2. Aggregate into relevant categories
3. Develop Standardized Minimal Data Sets and target quality reference ranges
4. Score MDS
5. Weigh Scores
6. Total to find *Baseline* BRIF Score

BRIF Outcome Index Example: Biobanks

- Relevant BRIF Categories for Clinical Care Outcomes could include:
  - Incidence and Prevalence of Disease
  - Diagnostic and Treatment Outcomes
  - Prevention and QOL Measures
  - Others TBD

BRIF Clinical Outcome Sample Indices:
Clinical Diagnosis and Treatment (MDS)

- Decreased Lag to Diagnosis
- Decreased Severity of Disease at Time of Diagnosis
- Decreased Time to Intervention and Initial Treatment
- Decreased Time to Surgery
- Increased Relevance of Correlated Clinical Pathology
- Increased Relevance of Related Research Finding
- Decreased Treatment Time
- Increased Efficacy of Pharmacological Intervention
- Decreased Incidence of Clinical Intervention related Complications, Serious Adverse Events
- Decreased lag to follow-up

BRIF Clinical Outcome Sample Indices: *Incidence and Prevalence of Disease (MDS)*

- Increased Rate of Prevention
- Increased Length of Survival with disease
- Increased Length of Survival post recovery
- Decreased
  - Prevalence rate overall
  - Incidence rate overall
  - Incidence of transmission
  - Incidence of recurrence rates
  - Incidence of metastasis
  - Death rate second to disease of relevance

BREF Overview

- BREF=Bioresource Research Economic Factors
- BREF Historical
  - Originally developed by L. Miranda as baseline Annual Reporting Criteria in 2005
  - Presented to NIH 2006, then adopted and implemented into initial NIH BP guidance in 2007 (BP forums)-2009/10 (BP documents)
  - Impetus, Intended Purpose and Application
    - Quantitative Evaluation of Three Critical Questions:
      - How Effectively Has The Bioresource Performed?
      - What Impact Has the Bioresource Had On Research?
      - Is There A Continuing Need For The Bioresource?
- Relevance to BRIF
  - Template - can extrapolate and translate outcomes to be BRIF centric

BREF:
Quantifying Financial Performance

Financial Performance Impact Measures Include:

- $$ worth of specimens the resource has provided to researchers
- $$$ value of projects & researchers supported with specimens/services from the Bioresource
- $$$ value of different specimen types that the Bioresource has provided
- $$$ value of difficult to obtain specimens made available to researchers by the resource
- Funds recouped from Collections/Distributions/Bioresource Services, repeat requests
- Grant Funding, Revenues and New projects funded from Bioresource related publications and support
- Cost efficiency reporting ($$$ Saved to Users) from innovation and/or tools, adherence to BP
- Per Specimen Savings

BREF:
Quantifying Financial Impact

Financial *Impact* Measures Include:

- Financial value of Bioresource's contribution towards:
  - Published studies using resource specimens
  - Registered Patents
  - FDA approval of a medical device
  - Development of useful technologies
    - (LIMS/BIMS, instrumentation, robotics, consumables, telecommunications, equipment...)
  - Development of useful research techniques
  - Development of infrastructure innovations (EBD)
  - Financial Efficiency related feedback from users
  - Determination of Cost per critical research finding
  - Impact of the Bioresource on their research
  - Financial impact of Institution from resource-related papers

BREF:
Demonstrating Continuing Need

Key *Continuing Need* Evaluation Questions include:

- Is the resource meeting its financial objectives?
- Is the Use Cost Effective?
- Is the Resource Financially Viable OR promoting sustainable development?
- Is the Value of specimens (and data) being provided (collected) worth the cost of running the Facility?
- What level of facilitation of scientific progress is necessary to support cost of operations?
- Has the resource improved financial issues regarding access to specimens for PI's?
- Evaluation of Financial issues related to duplication of effort
- Are PI based banks competing with OR impeding funding for central biospecimen resource?
- Is the Bioresource still needed?
- Financial comparison of alternative specimen sources
- Does the resource still require Stakeholder/Adjunct funding or is it self-sustaining?

Initial Recommendations (1)

1. Utilize the BRIF to assist Bioresource capability:
   - Create Universal Quality Score to Increase
     - Compatibility and relevance of collaboration, research specifically and overall
       - Specimen A Quality = Specimen E Quality
       - RIN to RIN
       - Data set A commensurate with Data Set E
     - Level of Adherence to Reporting Standards
       - BRISQ to BRISQ, STARD TO STARD…..

Initial Recommendations (2)

2. Develop Minimal BRIF Data Set- “Mini-BRIF”
   - Quality Indicators
   - Outcome (in progress, short, long term)
     - Track Work Products in all forms
     - Direct Product, Related Research and Clinical Outcomes
   - Economic Indicators
   - Other TBD…

Initial Recommendations (3)

3. Initially use as a manual Bioresource Tool to assist your current collaborations and Bioresource Development- Academic or otherwise…
4. Meanwhile Marry with Informatics Technology Application i.e. ORCID, others TBD
5. Pilot BRIF Tool across INSERM and BBMRI
6. Demonstrate "Proof of Concept"
   - Manual v. Automated
7. Publish as ROI Study and Technology Evaluation
8. Add BRIF tool into R&D BBMRI Tech Pipeline

Contact Information

BIOBUSINESS CONSULTING INC

Biobusiness Consulting Inc's chief **mission** includes ***provision of innovative guidance aimed at reduction of biobanking quality related "disparities"*** *performed in tandem with* ***promotion of sustainable, equitable financial and business development*** *to foster real time implementation of Best and Evidence based Biobanking practices in synergy with* ***actuation of biospecimen research based strategic partnerships.***

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